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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Andrew E. Pierce  
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EXAMINER

WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 11/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/601,602	<b>Applicant(s)</b> JACKSON ET AL.	
	<b>Examiner</b> Harry D. Wilkins, III	<b>Art Unit</b> 1742	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 October 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 and 18-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/08/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of group II in the reply filed on 3 October 2005 is acknowledged. The traversal is on the ground(s) that (1) groups I and II are not related as subcombination and combination, (2) groups III and I are not related as subcombination and combination. This is not found persuasive because of the reasons as stated in the restriction requirement: Group II is a cell (apparatus). Group I is a membrane. These two groups cannot be related as product and process of using since neither group is a process. Group II is further defined from group I by requiring that the membrane be polymeric. Notwithstanding the undesirability of using the claimed membrane in a chlor-alkali cell, it still would have been capable of operation using the claimed membrane. Group III is further distinguished from group I by not requiring a membrane at all, instead opting for a diaphragm.

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 8-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the

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invention. Applicant has not enabled one of ordinary skill in the art to make a "low" alkali metal ion transport efficiency because no composition has been fully described which meets the limitation, nor has a specific example been provided which meets the limitation. One of ordinary skill in the art, upon reading the specification, would have had no idea how to make a permselective membrane with the claimed low alkali metal ion transport efficiency having less than 60% transport efficiency, much less less than 20% transport efficiency.

4. Further in support of the position, the Examiner submits "Recovery of Sodium Hydroxide from Alkaline Waste Solutions", which describes various membranes, both polymeric and ceramic, and show that the sodium ion transport efficiency (migration efficiency) depends, not only on the membrane composition, but also the operating conditions in which the membrane is used. This cast further doubts as to how to make the invention as claimed. Can the invention be practiced with a membrane, which normally exhibits high transport efficiency, in such a way that the membranes inherent transport efficiency is lowered to be considered "low"?

5. Since the only disclosure of a composition of the membrane (see the first paragraph of page 14) merely states that a copolymer of tetrafluoroethylene and a perfluorovinyl monomer, one of ordinary skill in the art can only assume that every copolymer of that type had the claimed property.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 8-12 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kelham (US 4,902,397) with evidence from deNora (US 4,340,452) and deNora et al (US 4,381,979) (for claim 13 only).

Kelham anticipates the invention as claimed. Kelham teaches (see figures, abstract and col. 6, line 28 to col. 7, line 4) an electrolytic cell including a Nafion<sup>®</sup> membrane (a copolymer of tetrafluoroethylene and perfluorovinyl ether with sulfonic or carboxylic ion-exchange groups (see deNora at col. 11, lines 32-48)), a catalytic, metal anode and a catalytic, metal cathode.

Regarding claims 8-11 and 17, since the only disclosure of a composition of the membrane (see the first paragraph of page 14) merely states that a copolymer of tetrafluoroethylene and a perfluorovinyl monomer was suitable for achieving the claimed alkali metal ion transport efficiency, one of ordinary skill in the art can only assume that every copolymer of that type had the claimed property.

Regarding claim 12, Kelham teaches a platinum oxide coated titanium anode and a “known” electrocatalyst coated nickel cathode. The “known” electrocatalyst coating can be seen in deNora et al ('979) at col. 4, lines 38-47, which shows that the coating was a platinum group metal oxide.

8. Claims 8-12, 14 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Cohn et al (US 4,486,276) with evidence from deNora (US 4,340,452)

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Cohn et al anticipate the invention as claimed. Cohn et al teach (see figures, abstract and paragraph spanning cols. 3 and 4) an electrolytic cell comprising a Nafion® membrane (a copolymer of tetrafluoroethylene and perfluorovinyl ether with sulfonic or carboxylic ion-exchange groups (see deNora at col. 11, lines 32-48)), a catalytic, metal anode and a gas diffusion cathode.

Regarding claims 8-11 and 17, since the only disclosure of a composition of the membrane (see the first paragraph of page 14) merely states that a copolymer of tetrafluoroethylene and a perfluorovinyl monomer was suitable for achieving the claimed alkali metal ion transport efficiency, one of ordinary skill in the art can only assume that every copolymer of that type had the claimed property.

Regarding claim 12, Cohn et al teach (see col. 6, lines 50-58) using a ruthenium-oxide coated titanium or tantalum anode.

Regarding claim 14, Cohn et al teach a gas diffusion cathode.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelham (US 4,902,397) in view of deNora et al (US 4,381,979).

The teachings of Kelham are described above. Kelham teaches an electrocatalytically coated nickel cathode.

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Kelham does not teach that the cathode coating was a precious metal oxide coated on nickel or titanium.

DeNora et al teach (see col. 4, lines 38-47) a platinum group metal oxide coated on a substrate as the cathode.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the known electrocatalyst coating of deNora et al as the electrocatalyst coating of Kelham because the coating of deNora et al had low hydrogen overvoltage.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelham (US 4,902,397) in view of Brown et al (US 4,426,269).

The teachings of Kelham are described above. Kelham teaches an electrocatalytically coated nickel cathode.

Kelham does not teach that the cathode coating is selected from the group consisting of Ni-Mo, Co-Mo, Ni-W, Co-W, Ni-Fe and Ni-Co.

Brown et al teach (see abstract) an electrocatalytic coating of a Ni-Mo, Ni-W, Co-Mo or Co-W alloy.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the known electrocatalyst coating of Brown et al as the electrocatalyst coating of Kelham because the coating of Brown et al had improved catalytic stability (col. 1, lines 7-9).

12. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelham (US 4,902,397) in view of Kuo et al (US 4,105,531).

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The teachings of Kelham are described above. Kelham teaches an electrocatalytically coated cathode.

Kelham does not teach that the cathode coating was an alloy of Mo, V and Ni on a copper substrate.

Kuo et al teach (see abstract) a copper substrate coated with an alloy of Mo, V and Ni that has electrocatalytic activity.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the known electrocatalyst cathode of Kuo et al as the electrocatalyst cathode of Kelham because the cathode of Kuo et al had improved conductivity and corrosion resistance.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Hardy D Wilkins, III  
Examiner  
Art Unit 1742

hdw